# Table of Contents

MetroArchaeo 2017 Committee ................................................................. 5  
MetroArchaeo 2017 Keynote Speakers .................................................. 7  
Social Functions...................................................................................... 8  
Awards .................................................................................................... 9  
Maps ...................................................................................................... 10  
Program Schedule - Monday, October 23, 2017 .................................... 12  
Program Schedule - Tuesday, October 24, 2017 .................................. 14  
Program Schedule - Wednesday, October 25, 2017 ............................. 16  
Monday, October 23, 2017 .................................................................... 17  
Tuesday, October 24, 2017 ................................................................... 22  
Wednesday, October 25, 2017............................................................... 33
WELCOME TO THE
3rd IMEKO INTERNATIONAL CONFERENCE ON METROLOGY FOR ARCHAEOLOGY AND CULTURAL HERITAGE
MetroArcheo2017

On behalf of the organizing committee, we wish to welcome you to the 3rd IMEKO International Conference on Metrology for Archaeology and Cultural Heritage - MetroArcheo2017.

The growing interest of archaeological sciences to new technologies and analysis techniques, has recently improved the combined use of numerical approach and metrology systems to get more detailed archaeological purpose. Metrology, the science of measurements, includes all aspects both theoretical and practical with reference to the measurements, whatever their uncertainties are, and in whatever fields of science or technology they occur. Consequently, the field of valorisation, characterisation and preservation of Cultural Heritage too is deeply related to the metrological issues for the collection, interpretation and validation of data collected with different analytical tools, physical-chemical and mechanical techniques, digital technologies, new ICT tools, and so on.

The 3rd IMEKO International Conference on Metrology for Archaeology and Cultural Heritage - MetroArcheo2017 wants to gather together heritage scientists in universities, research institutions, museums, galleries, libraries, archives, small and medium enterprises. MetroArcheo2017, therefore, is conceived to foster exchanges of ideas and information, make connections and collaborations, update innovation on “measurements” suitable for Cultural Heritage among material scientists, chemists, physicists, engineers, archaeologists, conservators, restorers.

Following the positive experience of the first two editions hold in Benevento and Turin in 2015 and 2016, respectively, the conference moves to Lecce, a city in the Puglia region and the capital of Lecce Province. It is nicknamed “Florence of the South” thanks to the many Baroque monuments in the city. Lecce has ancient Roman roots and you can still see the remains of the Roman theatre and amphitheatre but Lecce really came into its own in the 17th century. During this prosperous period many palaces and churches were constructed from the soft local Lecce stone. In Lecce’s historic centre wander the charming lanes and discover the Baroque churches like the opulently decorated Basilica di Santa Croce with its façade of allegorical figures. The heart of the historic centre is in Piazza Sant’Oronzo where the Column of St Oronzo, Lecce’s patron saint stands and Piazza del Duomo, where you’ll see the 12th century Duomo and its 70 m high bell tower. The Niccolo’ and Cataldo Church is another masterpiece of embellished decorative arts.

MetroArcheo2017 will be held at Castello Carlo V, majestic fortification in the heart of Lecce. Just a few steps from Piazza Sant’Oronzo, it marks the point where the old town and the modern downtown area meet. The Castle hosts art exhibitions and cultural events, thus offering visitors the chance to admire its rigorous external architecture, so typical of 16th-century defensive structures, and its rich interior decoration.

We are sure that the universally recognized historical beauty of Lecce will be a perfect frame for this prestigious conference. It is, in fact, a further occasion, not only to meet old friends and new people from all over the world, but, moreover, to engage with them a continuous comparison directed to make wider the views on the technological progress of Metrology for Archaeology and Cultural Heritage.
MetroArchaeo2017 organization was a complex task due to the large and increasing interest of our research and application areas. Efforts from many people were required to shape the technical program, arrange accommodation, manage the administrative aspects, and set up the social functions. We like to take this opportunity to thank all and each of them. We like also to thank the public and private organizations that supported the meeting in different ways.

MetroArchaeo2017 hosts three plenary lectures and 21 oral and poster sessions designed to take advantage of a multidisciplinary approach to give to the Cultural heritage community, from archaeologists to historians, conservators, engineers and material scientists, a complete picture of the measurements utilizations and data treatments with the ultimate goal of increasing knowledge on the characterization and safeguard of archaeological and historic heritage, generally addressed in sectorial conferences. Thanks to all of the Technical Program Committee members and the reviewers who have contributed to make this outstanding program possible.

We received 263 abstracts from all over the world. The technical program encompasses several events and activities.

The keynote speeches will be held by experts in the field of metrology for archaeology;

PLENARY LECTURERS

• Clementina Panella, Sapienza - University of Rome, Italy; Rome Colosseum Square-Northeast Palatine Hill. The Archaeological excavation between research and transmission of memory.
• Francesco D’Andria, University of Salento, Italy; Hierapolis: “From Hell to Paradise”. Measuring the Antiquity on the threshold of Hades.
• Danilo Bersani, University of Parma, Italy; “New methods and trends in Raman Spectroscopy applied to art and archaeology”.
• Claire Pacheco, Centre de Recherche e Restauration des Musées de France, Palais du Louvre, Paris, France; “From AGLAE to the New AGLAE: uncertainty evolution of PIXE and RBS experimental data”.

Furthermore, attendees have the possibility to follow a half day of Tutorials;

• Best accuracy with aerial and terrestrial integrated technologies, Simone Gianolio, Archeo Digital SRLS
• Laser Technologies for the conservation of Cultural Heritage, Alessandro Zanini, EL.EN.
• Gathering and processing GPR data, Giovanni Leucci, National Research Council-IBAM, Raffaele Persico, National Research Council-IBAM, Paolo Papeschi, ITS GEORADAR.
• Non-invasive and Micro-invasive Diagnostic Analyses at the Service of the Cultural Heritage Market: Hints, Trends and Case Studies, Stefano Ridolfi, Ars Mensurae.
• Preliminary diagnostics for restoration of architectural and historic-artistic heritage, Giovanni Quarta, National Research Council-IBAM.
• Experiencing Innovative and digital approaches for the cultural heritage, Italo Spada, Consorzio CETMA.

With the aim of providing a common ground for researches to share their findings about the metrology for archaeology, the MetroArchaeo2017 includes a significant number of Special Sessions. A first reason is that so many are the application fields of the metrology for archaeology that a single track could have been too much dispersive. A second reason is that, in spite of a centralized research address definition, a spontaneous aggregation of well-focused themes has been gathered, with specific aim of providing a forum of specific debate very close to the single research field. Therefore, several application-oriented Special
Sessions have been organized. We wish to thank the organizers of these Special Sessions for their cooperation and support to the conference organization.

Several Awards will be assigned, in particular to young researchers.

The social programme includes a classic music performance by Polyphonic Choir of the University of Salento, the welcome party is held in the cloister of "Palazzo del Seminario" in Piazza Duomo, and the social dinner is held in the "Torre del Parco".

The 3rd International Conference on Metrology for Archaeology and Cultural Heritage is about to begin. You are now in a position to enjoy the fellowship of colleagues and experts and to pass free time in natural and artistic beauties. It is up to you to appreciate the conference worth! Be critical! We, metrologists, archaeologists, geologists, colleagues, and friends, we know that this is the best way to improve quality, and to achieve lasting excellences.

General co-Chair
Lucio Calcagnile
University of Salento, Italy

General co-Chair
Pasquale Daponte
University of Sannio, Italy
MetroArchaeo 2017 Committee

**General Chairs**
Lucio Calcagnile, *University of Salento, Italy*
Pasquale Daponte, *University of Sannio, Italy*

**Technical Program Chairs**
Andrea Cataldo, *University of Salento, Italy*
Giovanni Leucci, *IBAM-CNR, Italy*
Gianluca Quarta, *University of Salento, Italy*

**Scientific Committee**
Emma Angelini, *Politecnico di Torino, Italy*
Giovanni Buccolieri, *University of Salento, Italy*
Luca Cerchiai, *University of Salerno, Italy*
Marisa D’Elia, *University of Salento, Italy*
Gabriele Giancane, *University of Salento, Italy*
Sabrina Grassini, *Politecnico di Torino, Italy*
Celestino Grifa, *University of Sannio, Italy*
Alessio Langella, *University of Sannio, Italy*
Giovanni Leucci, *Consiglio Nazionale delle Ricerche, Italy*
Carmine Lubritto, *Università degli Studi della Campania "Luigi Vanvitelli", Italy*
Marco Parvis, *Politecnico di Torino, Italy*
Raffaele Persico, *IBAM-CNR, Italy*
Gianluca Quarta, *University of Salento, Italy*
Alfonso Santoriello, *University of Salerno, Italy*
Antonio Serra, *University of Salento, Italy*

**Award Chair**
Lara Pajewski, *Uniroma 1, Italy*

**Tutorial Chairs**
Xavier Rodier, *Université François-Rebelais, France*
Marco Rendeli, *University of Sassari, Italy*

**International Programme Committee**
Paul R. Arthur, *University of Salento, Italy*
Giovanni Azzena, *University of Sassari, Italy*
Salvatore Barba, *University of Salerno, Italy*
José Antonio Barrera Vera, *University of Seville, Spain*
Luca Bondioli, *University of Napoli L'Orientale, Italy*
Jean-Pierre Brun, *Collège de France, France*
Gert - Jan Burgers, *VU University Amsterdam, Netherlands*
Franco Cambi, *University of Siena, Italy*
Stefano Campana, *University of Siena, Italy*
Piergiulio Cappelletti, *University of Napoli Federico II, Italy*
Paolo Carafa, *University of Roma La Sapienza, Italy*
Massimo Carpinelli, *University of Sassari, Italy*
Lucio Colizzi, CETMA, *Technologies, Design and Materials European Research Centre, Italy*
Stéfanie Cretté, *Clemson University, USA*
Giuseppe Cultrone, *University of Granada, Spain*
Claudio De Capua, *University Mediterranea of Reggio Calabria, Italy*
Hélène Dessalles, *Ecole Normale Supérieure, France*
Christian Fischer, *University of California, Los Angeles, USA*
Venice Gouda, *National Research Centre, Egypt*
Maria Iacovou, *University of Cyprus, Cyprus*
Lara Maritan, *University of Padova, Italy*
Vincenzo Morra, *University of Napoli Federico II, Italy*
Priscilla Munzi, Centre Jean Bérard, *France*
Giacomo Pardini, *University of Salerno, Italy*
Alessandra Pecci, *University of Barcelona, Spain*
Salvatore Piro, Consiglio Nazionale delle Ricerche, *Italy*
Emanuele Pizzi, Sapienza Università di Roma, *Italy*
Juan Antonio Quiróz Castillo, Universidad del Pais Vasco, *Spain*
Fabio Remondino, Fondazione Bruno Kessler, *Italy*
Carmen Maria Rosskopf, University of Molise, *Italy*
Elda Russo Ermolli, *University of Napoli Federico II, Italy*
Maria Rosaria Senatore, University of Sannio, *Italy*
Emanuela Sibilia, University of Milano Bicocca, *Italy*
Martijn Van Leusen, University of Groningen, *Netherland*

**Local Committee**
Egidio De Benedetto, *University of Salento, Italy*
Lara De Giorgi, IBAM-CNR, *Italy*
Francesco Picariello, *University of Sannio, Italy*
Maria Riccio, University of Sannio, *Italy*
Liliana Viglione, University of Sannio, *Italy*

**Local Arrangements**

www.athenaconsulting.eu
13:09 Experimental methodology for measuring the structural dynamic transmission damping of a cultural heritage tower
Mariella Diaferio, Polytechnic of Bari, Italy
Dora Foti, Polytechnic of Bari, Italy
Nicola Ivan Giannoccaro, University of Salento, Italy
Salvador Ivorra, University of Alicante, Italy

11:45 - 13:30
Session on Process and Method Innovation for Cultural, Archeological and Landscape Heritage
Chair: Giovanna Mangialardi, University of Salento, Italy
Room: Castle Carlo V, Torremozza Hall

11:45 WebGIS, 3D modeling and virtual tours to map, record and visualize the cultural, archaeological and landscape heritage: the VisualVersilia project
Martina Giannini, University of Modena and Reggio Emilia, Italy
Cristina Castagnetti, University of Modena and Reggio Emilia, Italy
Riccardo Rivola, Geomatics Engineering Innovative Solutions Srl, Italy

12:07 ICV and fine-registration algorithms for an efficient merging of point-clouds
Domenica Costantino, Politecnical University of Bari, Italy
Maria Giuseppa Angelini, Politecnical University of Bari, Italy
Francesco Settembrini, Politecnical University of Bari, Italy

12:24 BIM models to manage and make use of cultural heritage
Francesca D’Uffizi, SPraUt snc, Italy
Sara Manarin, SPraUt snc, Italy

12:41 Business Process Management and Building Information Modeling for the innovation of cultural heritage renovation process
Ada Malagnino, University of Salento, Italy
Giovanna Mangialardi, University of Salento, Italy
Angelo Corallo, University of Salento, Italy
Giorgio Zavarise, University of Salento, Italy

12:58 Hazard and Risk Assessment and Perception in the Analysis of Cultural Heritage
Mirta Sibilia, IAEA XRF Beamline, Italy
Franco Zanini, Scuola Interateneo di Specializzazione in Beni Archeologici, Italy

13:15 Mobile app for promoting cultural heritage: geostatistic and textual analysis
Angelo Corallo, University of Salento, Italy
Laura Fortunato, University of Salento, Italy
Clara Renna, University of Salento, Italy
Marco Lucio Sarcinella, University of Salento, Italy
Alessandra Spennato, University of Salento, Italy